

REMARKS

Claim 1 has been amended in order to provide a more accurate definition of the invention claimed therein.

Applicants note that Claims 6-15 and 23-26 have been allowed.

Claims 1-5 and 16-22 stand rejected under 35 U.S.C. 112, first paragraph, as the disclosure is enabling only for claims limited to methods of treating severe combined immunodeficiency syndrome using therapeutic gene transfer to autologous CD34+ cells obtained from cord blood wherein the cells have been genetically engineered with a nucleic acid sequence encoding adenosine deaminase and further, wherein said cord blood cells are administered to a patient such that said nucleic acid encoding adenosine deaminase is expressed in an amount sufficient to provide a therapeutic effect. This rejection is respectfully traversed.

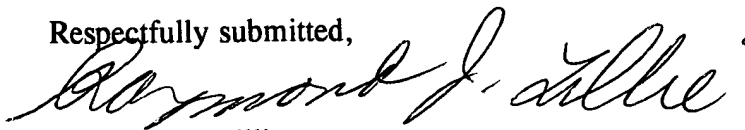
Claim 1 as amended is directed to a method of expressing a therapeutic agent in a human. The method comprises administering autologous CD34+ cells obtained from cord blood to the human. The autologous CD34+ cells have been genetically engineered to include at least one nucleic acid sequence encoding a therapeutic agent.

As the Examiner admits, Applicants have demonstrated the genetic engineering of autologous CD34+ cells obtained from cord blood, and the administration of such cells to an infant, whereby such cells express adenosine deaminase in the infant. Thus, Applicants have demonstrated the principle that one may genetically engineer autologous CD34+ cells

obtained from cord blood with a nucleic acid sequence encoding a therapeutic agent, and administer the cells to a human, whereby the therapeutic agent is expressed in the human. Applicants need not demonstrate that autologous CD34+ cells obtained from cord blood can be engineered with every possible nucleic acid sequence encoding a therapeutic agent and that each therapeutic agent be expressed in the human once the genetically engineered cells are administered to the human. (See Ex parte Mark, 12 U.S.P.Q.2d 1904 (Bd. App. Int. 1989).) Because Applicants have demonstrated that adenosine deaminase can be expressed in a human by practicing the claimed method, one skilled in the art would expect reasonably that autologous CD34+ cells obtained from cord blood could be genetically engineered with nucleic acid sequences encoding other therapeutic agents, and that such cells may be administered to a human, whereby such therapeutic agents may be expressed in the human. The burden is upon the Examiner to show that one cannot genetically engineer autologous CD34+ cells with a nucleic acid sequence encoding a therapeutic agent, and/or cannot administer such genetically engineered cells to the human for expression of the therapeutic agent in the human. (See In Re Marzocchi, 169 U.S.P.Q. 367 (C.C.P.A. 1971)). The Examiner, however, has provided no evidence that autologous CD34+ cells obtained from cord blood could not be genetically engineered with nucleic acid sequences encoding therapeutic agents other than adenosine deaminase, or that the autologous CD34+ cells, when returned to the human, could not express therapeutic agents other than adenosine deaminase in the human. Thus, because Applicants have demonstrated that one could express a therapeutic agent in a human by following the claimed method, the specification

provides an enabling disclosure. For the above reasons and others, this application is in condition for allowance, and it is therefore respectfully requested that the rejection under 35 U.S.C. 112, first paragraph, be reconsidered and withdrawn and a favorable action is hereby solicited.

Respectfully submitted,



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